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ABSTRACT

This guide defines apprenticeship as a training program in industrial and craft occupations that require a wide and diverse range of skills and knowledge. It combines supervised on-the-job training and experience with technical classroom studies in subjects related to the trade. Formal apprenticeship training programs must be approved by the U.S. Department of Labor and conducted according to written standards. This guide, written especially for the state of Virginia, explains the basics of apprenticeship programs and provides information about 49 apprenticeable occupations. The first part provides information about the following: definition and overview of apprenticeship; where to apply for apprenticeships; general qualifications for apprenticeship applicants; the selection process; training procedures; typical questions and answers about apprenticeship programs in Virginia; apprenticeship contacts and administrative agents in Virginia; and Virginia apprenticeable occupations. The second part of the guide describes 49 apprenticeable occupations. Each one-page description includes the following: Dictionary of Occupational Titles, Occupational Employment Survey, and Guide to Occupational Exploration codes for the job title; alternative titles for the occupation; specific vocational preparation time; classroom requirements; job skills and duties; average length of time it takes to find employment in the fields; and national average salary range. (KC)

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Apprenticeship

VIRGINIA

1995 - 1996



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Apprenticeship

VIRGINIA

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Definition and Overview

An apprenticeship is a training program in those industrial and craft occupations which require a wide and diverse range of skills and knowledge. It combines supervised on-the-job training and experience with technical classroom studies in subjects related to the trade.

As practiced by modern industry, apprenticeship is a business-like system in which the worker entering a particular industry is given intensive instruction and experience in all of the theoretical and practical aspects of a given skilled occupation, craft, or trade.

Nationally, apprenticeship programs train workers in over 800 occupations. The training period ranges from one to six years, depending on the particular skill or trade involved. Most require three to four years of training with four years being most frequent. Some programs may be accelerated if they include opportunities to work overtime. Those who successfully complete an apprenticeship program may become journeypersons (also known as journeymen or qualified workers) in the occupation.

For the worker entering employment, apprenticeship programs provide opportunities to develop skills and knowledge to improve economic stability and assure a guaranteed wage with regular salary increases while learning.

Mastering a particular trade requires: (a) learning the skills of the trade; (b) perfecting the use of each specific skill; (c) bringing each skill up to the speed and accuracy required by the job; and (d) learning to use the specific skills in combination with others.

Formal apprenticeship training programs must be approved by the U.S. Department of Labor and conducted according to written standards. The beginning apprentice is expected to sign a written apprenticeship agreement which has been registered with the Bureau of Apprenticeship and Training of the U.S. Department of Labor. The apprentice will receive a certificate of completion from the federal or state government after successfully fulfilling training obligations. A journeyperson's card is a union shop's sanction of this certificate.

Where to Apply

Apprentices receive training in the industrial trades, building trades, and service occupations. Applications for apprenticeship programs may be secured from an employer, a labor union, or a joint apprenticeship and training committee. Many of the field service offices of the Virginia Employment Commission have apprenticeship specialists who will refer jobseekers to employers who want to hire an apprentice. The apprenticeship specialists can provide brochures with specific trade information and testing and referral for apprenticeship programs. Apprenticeships are available also in several branches of military service. Contact local recruiters for more information.

General Qualifications for Apprenticeship Applicants

1. Age: Generally, applicants should be at least 16 years of age.
2. Education: Usually applicants must have a high school diploma or possess a General Education Diploma (GED).
3. Physical fitness: Applicants must be physically fit to perform the work of the trade. A medical examination prior to employment may be required.
4. Experience: Some credit may be given for appropriate previous experience.

Selection Process

The selection process is determined by individual sponsors and is aimed at:

1. Assuring continued recruitment of the best-qualified applicants.
2. Continuing to extend opportunities to qualified applicants on a nondiscriminatory basis and without regard to an individual's race, color, sex, creed, or national origin.

Federal regulations require certain selection procedures to assure equal employment opportunity in apprenticeship and training. A program with five or more apprentices is required to have its affirmative action plan in writing. If activities fall short, the sponsor must be able to show that efforts were made in good faith. If the preliminary requirements have been met, the applicant may be required to fill out an apprentice application form.

Applicants may be evaluated on their education (academic record), work (job) experience, personal background, aptitude test scores, and an oral interview.

The actual number of applicants accepted into an particular program at any given time will depend upon the number of journeypersons currently employed by the sponsor.

Training Procedures

All apprenticeship programs combine on-the-job training with related technical classroom instruction. Each apprentice receives direct supervision of shop training from a journeyperson in the particular trade. The workday and workweek are the same as those of journeypersons.

Classroom instruction normally is more than 144 hours per year. Related instruction may be provided during regular working hours. Classes may be held at public school facilities, such as community colleges or on the work premises (vestibule training).

The apprentice's classroom instruction is reviewed periodically to determine that satisfactory progress has been achieved.

All apprentices are paid a wage while learning. Generally, the apprentice will receive a percentage of the journeyperson's wage rate with increases at intervals of 2,000 hours. Upon satisfactory completion of the apprenticeship program, apprentices receive the beginning journeyperson's wage rate.

Typical Questions and Answers About Apprenticeship Programs in Virginia

Who is a journey worker?

A person who has completed apprenticeship training in a trade or craft.

How long have apprenticeship programs been in existence?

Historically, apprenticeship systems in some form have existed since ancient Greece and Rome. However, the system, as we know it today, was formally organized during the Middle Ages. With the industrial revolution, many European crafts people migrated to America in the middle and late 1800's; thus, for a generation the need for crafts people in America was reduced. However, by the turn of this century, skilled crafts people were in demand.

What major types of legislation have aided the growth of apprenticeship in the U.S.?

In 1937, Congress passed the Federal Apprenticeship Act which established area and regional supervision of apprenticeship programs throughout the United States. To implement the Act, the Bureau of Apprenticeship Training (BAT) was created within the Department of Labor.

Under what state legislation do apprenticeships in Virginia operate?

In 1938, Virginia first passed the "Virginia Voluntary Apprenticeship Act" which created a State Apprenticeship Council (SAC) recognized by the Bureau of Apprenticeship and Training (BAT), U.S. Department of Labor, to provide for the development of apprentice training in Virginia. To implement this program, the apprenticeship division of the Virginia Department of Labor and Industry was formed. Thus in Virginia there are two agencies--one federal (BAT) and one state (SAC) to promote and develop apprenticeship under the auspices of one agency, the Virginia Apprenticeship Council.

Who sponsors apprenticeship programs?

Apprenticeship programs may be sponsored by an employer, an association of employers, a joint apprenticeship committee, or an organization of employees having an approved apprenticeship program registered with the Virginia Apprenticeship Council (Chapter 6, Title 40.1, *Code of Virginia*, 1950).

Who is eligible for apprenticeship training?

Men and women 16 years of age or over are usually eligible for training. They must be physically able to carry out the job requirements, and some occupations require a high school diploma (or equivalency) with certain subjects specified.

Do individuals receive certificates upon the completion of apprenticeship training?

Yes. Upon the completion of training, apprentices receive certificates of completion from the state apprenticeship agency or from the federal Bureau of Apprenticeship and Training.

How does the student/apprentice program work?

A school-approved program may be a formal school work/study situation such as Industrial Cooperative Training (ICT) or simply a letter from the high school principal stating that he/she approves of the student working part-time after school.

Where does one apply for apprenticeship?

Applications may be obtained from the employer, local unions for the trade desired, and the joint apprenticeship committees. **THE EMPLOYER (PROGRAM SPONSOR) IS THE ONLY SOURCE FOR APPLICATIONS.** Additional information regarding programs accepting applications may be obtained from local Virginia Employment Commission offices and local offices of the Division of Apprenticeship Training and/or the Bureau of Apprenticeship and Training offices.

Why can't individuals always obtain an apprenticeship in a given occupation at a particular time?

Employment is based on supply and demand. The economy, the labor supply, the demand for laborers in a given occupation at a given geographic location, and other factors determine the extent to which apprentices are needed. In addition, the decision to sponsor an apprentice rests with the employer, the association of employers, the Joint Apprenticeship Committee, or the organization of employees registered with the Apprenticeship Council.

May individuals receive certificates of apprenticeship through military training programs?

There are military occupations registered with the U.S. Department of Labor. When individuals complete the required courses and number of hours of practical experiences, they may receive a certificate of apprenticeship from the Department of Labor. For more information, contact the local military recruiter. Recognition of courses and training taken in the military are evaluated by apprenticeship sponsors.

Does completing a secondary vocational program, community college program, or other postsecondary program help individuals get into an apprenticeship program?

If the education and training relates to the apprenticeship program, it often helps individuals obtain jobs where employers sponsor apprenticeship programs. However, apprentices must take formal classroom training during the apprenticeship period. These must be classes required by the industry which have not been previously taken. Some community colleges and area vocational technical schools offer training in conjunction with apprenticeship programs. For more information, contact

community college or vocational centers of interest and the apprenticeship contact listing in this publication.

Does employment in specific industries or work settings help individuals locate apprenticeship programs?

Many apprenticeship programs are often available to employees or individuals who have already been employed by a particular industry or company.

Apprenticeship Contacts

Statewide: All Industries

Apprenticeship Division Director
Virginia Department of Labor & Industry
Powers-Taylor Building
13 South Thirteenth Street
Richmond, Virginia 23219

TEL: (804) 786-2381

James F. Walker
State Director
Bureau of Apprenticeship & Training
U.S. Department of Labor
700 Centre
704 E. Franklin Street, Suite 546
Richmond, Virginia 23219

TEL: (804) 771-2488

Terry Morauer
Representative
Virginia Merit Shop Education Foundation
Virginia Chapter
6601 Little River Turnpike, Suite 320
Alexandria, Virginia 22312

TEL: (703) 941-5596

Statewide: Electrical

Harold Kelly
Representative
Virginia Electrical Contractors Apprenticeship Program
7814 Carousel Lane, Suite 300
Richmond, Virginia 23229

TEL: (804) 346-4445

Statewide: Plumbing, Heating, & Air Conditioning

James S. Steinle
Virginia Association of
Plumbing-Heating-Cooling Contractors
Atomic Plumbing Heating & Electrical Corp.
6900-A Thurston Avenue
Virginia Beach, Virginia 23455

TEL: (804) 464-2934

National Plumbing-Heating-Cooling
Contractors Association, Inc
180 S. Washington Street
P.O. Box 6808 (Zip for P.O. Box 22040)
Falls Church, Virginia 22046

TEL: (703) 237-8100

Statewide: Bricklayers

Eugene Stinner
International Union of Bricklayers
815 Fifteenth Street, NW
Washington, DC 20005

TEL: (202) 783-3788

Northern Region: All Industries

Janet L. Pack/John Jardine
Apprenticeship Representative
Virginia Department of Labor & Industry
11211 Waples Mill Road, Suite 302
Fairfax, Virginia 22030

TEL: (703) 359-1167

Northern Region: Plumbing, Heating, & Air Conditioning

John Shreve
Northern Virginia Plumbing-Heating-Cooling
Contractors Association, Inc
212 North West Street
Falls Church, Virginia 22046

TEL: (703) 532-2288

Northern Region: Plumbing

James C. Spencer
Washington, DC Plumbing Apprenticeship Committee
8509 Ardwick-Ardmore Road
Landover, Maryland 20785

TEL: (301) 322-8810

Richmond Region: All Industries

Nat B. Dailey or
James C. Beck
Apprenticeship Representative
U.S. Department of Labor
Bureau of Apprenticeship and Training
700 Center
704 E. Franklin Street, Suite 546
Richmond, Virginia 23219

TEL: (804) 771-2488

Position Vacant
Regional Representative or
Harry Seay, Field Supervisor
Virginia Department of Labor & Industry
13 South Thirteenth Street
Richmond, Virginia 23219

TEL: (804) 786-8844

TEL: (804) 786-3259

Richmond Region: Carpentry

Richard Eppard
Richmond Carpenter JATC
3801 Jefferson Davis Highway
Richmond, Virginia 23234

TEL: (804) 275-8171

Richmond Region: Plumbing, Heating, & Air Conditioning

J.E. Rogali
Coordinator
Local 10
3801 Jefferson Davis Highway
Richmond, Virginia 23234

TEL: (804) 743-8901

Richard J. Tilley
Representative
Plumbing-Heating-Cooling
Contractors Association of Richmond
11058 Washington Highway, Suite 1
Glen Allen, Virginia 23059

TEL: (804) 798-7702

Richmond Region: Sheet Metal

Warren H. Lacy
Apprentice Coordinator
Sheet Metal Local 100
8409 Ferdonia Road
Richmond, Virginia 23227
Raymond C. Louth
3204 Cutshaw Avenue
Richmond, Virginia 23230

TEL: (804) 266-3245

TEL: (804) 353-2425

Richmond Region: Electrical

Richard C. Ritz
Coordinator
Richmond Electricians JATC
3805 Cutshaw Avenue, Suite 108
Richmond, Virginia 23220

TEL: (804) 353-2655

Rudy Jones
Training Director
Central Virginia Electrical Contractor's Association, Inc.
5601 Pleasant Ridge Drive
Providence Forge, Virginia 23140

TEL: (804) 966-2751

Richmond Region: Bricklayers

Bricklayers Union
Local No. 1 of Virginia
3204 Cutshaw Avenue
Richmond, Virginia 23230

TEL: (804) 355-4789

Richmond Region: Iron Workers

David G. Taylor
Millwright JAC
3801 Jefferson Davis Highway
Richmond, Virginia 23224

TEL: (804) 275-8090

Bob Becker
Ironworkers Local 28, JAC
609 Linden Tower, 2nd & Franklin Sts.
Richmond, Virginia 23219

TEL: (804) 649-9641 or
(804) 643-7685

Southwestern Region: All Industries

William D. Poats
Apprenticeship Representative
Virginia Department of Labor & Industry
Broadmoor Plaza Office Center
Route 340, Suite 101
Stuarts Draft, Virginia 24477

TEL: (703) 337-3225

Connie M. Perry
Southwest Virginia Regional Supervisor
Virginia Department of Labor & Industry
3103 Brammer Village
Roanoke, Virginia 24019

TEL: (703) 562-3580

Calon H. Burrus
Apprenticeship Representative
Virginia Department of Labor & Industry
3704 Old Forest Road, Suite B
Lynchburg, Virginia 24501

TEL: (804) 385-0806

Patricia P. Moore
Apprenticeship Representative
Virginia Department of Labor & Industry
Brooksfield Square, Suite 4
966 West Main Street
Abingdon, Virginia 24210

TEL: (703) 676-5465

Southwestern Region: Plumbing, Heating, & Air Conditioning

Don Fitzgerald
Business Agent
Plumbers & Steamfitters Local No. 491
1606 Orange Avenue, NW
Roanoke, Virginia 24017

TEL: (703) 345-7611

Southwestern Region: Carpentry

Jim Wright
Roanoke Carpenter & Millrights No. 319
1202 Jamison Avenue, S.E.
Roanoke, Virginia 24013

TEL: (703) 343-2621

Southwestern Region: Sheet Metal

Michael Mays
Apprentice Coordinator
Sheet Metal Local 100
2101 Dale Avenue, S.E.
Roanoke, Virginia 24013

TEL: (703) 345-9585

Southwestern Region: Electrical

David Johnson
Roanoke Electricians No. 637
6306 Peters Creek Road
P.O. Box 2503
Roanoke, Virginia 24019

TEL: (703) 563-0336

Southwestern Region: Iron Workers

Walter W. Wise, Jr.
Iron Workers Local #697
5109 Hildebrand Avenue, N.W.
Roanoke, Virginia 24012

TEL: (703) 366-1429

Southwestern Region: Painters

William L. Bova
Painters Local Union 891
1202 Jamison Avenue, S.E.
Roanoke, Virginia 24013

TEL: (703) 343-0239

Tidewater Region: All Industries

E. Louise Griggs/James Davis
Apprenticeship Representative
Virginia Department of Labor & Industry
2600 Eltham Avenue, Suite 105
Norfolk, Virginia 23513

TEL: (804) 858-6700

Tidewater Region: Electrical

Ronnie Steele
Coordinator
Hampton Roads JATC
7812 Warwick Boulevard
Newport News, Virginia 23607

TEL: (804) 245-1040

Carol N. Dekker
Coordinator
JATC of the Tidewater Electrical Industry
1500 E. Little Creek Road
Norfolk, Virginia 23518

TEL: (804) 480-2812

Tidewater Region: Plumbing, Heating, & Air Conditioning

Jim Stienle
Representative
Southeastern Plumbing-Heating-Cooling Contractors Association
Atomic Plumbing & Heating, Inc.
5900 Thurston Avenue, Unit A
Virginia Beach, Virginia 23455

TEL: (804) 464-2934

Dwight Keatts
Business Manager
Local 540 - Newport News
7812 Warwick Boulevard
Newport News, Virginia 23607

TEL: (804) 247-9089

Patricia L. Stephenson
Contact
Local 110 Apprenticeship Program - Norfolk, VA
520 Naval Base Road
Norfolk, Virginia 23505

TEL: (804) 480-1027

Tidewater Region: Construction

Sandy Bixler
Director, Training & Employment Services
Tidewater Builders Association
2117 Smith Avenue
Chesapeake, Virginia 23320

TEL: (804) 420-2566

Donald S. Kemp
Operating Engineers Apprenticeship Program
3 Koger Executive Center, Suite 108
Norfolk, Virginia 23502

TEL: (804) 461-4505

Tidewater Region: Carpentry

Philip Vaughn
Tidewater Carpenter JATC
7442 Tidewater Drive
Norfolk, Virginia 23502

TEL: (804) 583-7322

Tidewater Region: Sheet Metal

Steve Whitehurst
Apprentice Coordinator
Sheet Metal Local 100
1500 East Little Creek Road
Room 207B
Norfolk, Virginia 23518

TEL: (804) 587-5566

Tidewater Region: Plaster & Cement Finishers

A. H. Clarkson
Tidewater Plaster & Cement Finishers
11 Raymond Drive
Hampton, Virginia 23666

TEL: (804) 838-0573

Tidewater Region: Bricklayers

Joe Circelli, Jr.
Representative
Bricklayers Union-Norfolk
7442 Tidewater Drive
Norfolk, Virginia 23505

TEL: (804) 588-5747

Administrative Agents
Apprenticeship-Related Instruction Management System
Regional-Related Instruction Centers and Coordinators

1. Charlottesville-Albemarle Technical Education Center

Albemarle County
Fluvanna County
Madison County
Rappahannock County

Buckingham County
Greene County
Nelson County
Charlottesville City

Culpeper County
Louisa County
Orange County

Coordinator:

John Baker
CATEC
1000 East Rio Road
Charlottesville, Virginia 22901

TEL: (804) 973-8012
(804) 973-4461
(804) 973-7588
FAX: (804) 973-4876

2. Danville Community College

Halifax County
South Boston City

Pittsylvania County

Danville City

Coordinator:

Shelia Wright
Danville Community College
1008 South Main Street
Danville, Virginia 24541

TEL: (804) 797-2222, Ext. 214
FAX: (804) 792-6810

Provider:

William Moire
Halifax County Schools

TEL: (804) 476-2171
FAX: (804) 476-1858

3. Fairfax - Pimmit Hills Center

Arlington County
Prince William County
Falls Church City

Fairfax County
Alexandria City
Manassas City

Fauquier County
Fairfax City
Manassas Park City

Coordinator:

Dr. Ellen Carlos
Pimmit Hills Center
Fairfax Public Schools
7510 Lisle Avenue
Falls Church, Virginia 22043

TEL: (703) 506-2247
FAX: (703) 506-2327

Apprenticeship Related Instruction Library

TEL: (703) 506-2247

4. Loudoun County Schools

Clarke County
Loudoun County

Fauquier County
Warren County

Frederick County
Winchester City

Coordinator:

Michael Megeath, Principal
Charles S. Monroe Technical Center
715 Childrens Center Road, SW
Leesburg, Virginia 22075

TEL: (703) 771-6560

5. Jackson River Technical Center

Alleghany County
Rockbridge County
Covington City

Bath County
Buena Vista City
Lexington City

Botetourt County
Clifton Forge City

Coordinator:

James A. Cantrell
Jackson River Technical Center
105 East County Club Lane
Covington, Virginia 24426

TEL: (703) 862-1308
FAX: (703) 862-3592

6. Patrick Henry Community College

Franklin County
Martinsville City

Henry County

Patrick County

Coordinator:

Becky Aydlett
Patrick Henry Community College
P.O. Drawer 5311
Martinsville, Virginia 24115

TEL: (703) 638-8777, Ext. 278

7. Central Virginia Community College

Amherst County
Campbell County

Appomattox County
Prince Edward County

Bedford County
Lynchburg City

Coordinator:

Patrick Ephriam
Central Virginia Community College
3506 Wards Road
Lynchburg, Virginia 24502

TEL: (804) 386-4656

TEL: (804) 386-4500

FAX: (804) 386-4681

Provider:

Lynchburg City Schools

8. Massanutten Technical Center

Page County
Harrisonburg City

Rockingham County

Shenandoah County

Coordinator:

Lester A. Smith
Massanutten Technical Center
325 Pleasant Valley Road
Harrisonburg, Virginia 22801

TEL: (703) 434-5961

FAX: (703) 434-1402

9. New Horizons Regional Education Center

Gloucester County
Middlesex County
Newport News City

James City County
York County
Poquoson City

Mathews County
Hampton City
Williamsburg City

Coordinator:

John C. Murphy
New Horizons Regional Education Center
520 Butler Farm Road
Hampton, Virginia 23666

TEL: (804) 766-1101
FAX: (804) 766-2458

10. Norfolk Technical Vocational Center

Accomack County
Southampton County
Norfolk City
Virginia Beach City

Isle of Wight County
Chesapeake City
Portsmouth City

Northampton County
Franklin City
Suffolk City

Coordinator:

Earl L. Royer
Norfolk Technical Vocational Center
1330 North Military Highway
Norfolk, Virginia 23502

TEL: (804) 441-5625
FAX: (804) 441-5713

11. Richmond Technical Center

Amelia County
Dinwiddie County
Henrico County
New Kent County
Surry County
Hopewell City

Charles City County
Goochland County
King & Queen County
Powhatan County
Sussex County
Petersburg City

Chesterfield County
Hanover County
King William County
Prince George County
Colonial Heights City
Richmond City

Coordinator:

Vance Horne
Richmond Technical Center
2020 Westwood Avenue
Richmond, Virginia 23230

TEL: (804) 780-6018
FAX: (804) 780-6061

Provider:

John Tyler Community College

12. Roanoke City - Patrick Henry High School -
Gibboney Vocational Technical Education Center

Botetourt County
Roanoke County

Craig County
Roanoke City

Franklin County
Salem City

Coordinator:

James G. White
Roanoke Regional Apprenticeship Center
2200 Grandin Road, SW
Roanoke, Virginia 24015

TEL: (703) 981-1061
FAX: (703) 981-1618

13. Spotsylvania Vocational Center

Caroline County
Lancaster County
Spotsylvania County
Fredericksburg City

Essex County
Northumberland County
Stafford County
Town of Colonial Beach

King George County
Richmond County
Westmoreland County

Coordinator:

Lee Browning
Spotsylvania Vocational Center
6703 Smith Street Road
Spotsylvania, Virginia 22553

TEL: (703) 898-2655
FAX: (703) 891-1784

14. Southside Virginia Community College

Brunswick County
Cumberland County
Lunenburg County
Prince Edward County

Buckingham County
Greensville/Emporia
Mecklenburg County

Charlotte County
Halifax/South Boston
Nottoway County

Coordinators:

Rowland F. Filer, III
Southside Community College
Christanna Campus
Route 1, Box 60
Alberta, Virginia 23821

TEL: (804) 949-1000
FAX: (804) 949-7863

Dr. Al Yoder
Daniel Campus
Route 1, Box 15
Keysville, Virginia 23947

TEL: (804) 736-2000

15. Valley Vocational Technical Center

Augusta County
Staunton City

Highland County
Waynesboro City

Rockbridge County

Coordinator:

Wiley J. Craig
Valley Vocational Technical Center
Route 1, Box 265
Fishersville, Virginia 22939

TEL: (703) 245-5009
FAX: (703) 885-0407

16. Wytheville Community College

Bland County
Dickenson County
Grayson County
Pulaski County
Smyth County
Wise County
Bristol City

Buchanan County
Floyd County
Lee County
Russell County
Tazewell County
Wythe County
Christiansburg City

Carroll County
Giles County
Montgomery County
Scott County
Washington County
Blacksburg City
Norton City

Coordinator:

James Gaynor
Wytheville Community College
100 E. Main Street
Wytheville, Virginia 24382

TEL: 1-800 468-1195
(703) 228-5541
FAX: (703) 228-6506

Other Providers in Western Virginia

Blacksburg High School
Patrick Henry Dr.
Blacksburg, Virginia 24060

TEL: (703) 951-4455

New River Community College
Route 100 North
Dublin, Virginia 24084

TEL: (703) 674-3600

Virginia Highlands Community College
P.O. Box 828
Abingdon, Virginia 24212

TEL: (703) 628-6094

Virginia High School
Long Crescent Drive
Bristol, Virginia 24201

TEL: (703) 669-2136

Mountain Empire Community College
Drawer 700
Big Stone Gap, Virginia 24219

TEL: (703) 523-2400

Southwest Virginia Community College
P.O. Box SPCC
Richlands, Virginia 24641

TEL: (703) 964-2555

Wise County Vocational Center
P.O. Box 1218
Wise, Virginia 24293

TEL: (703) 328-6113

Virginia Apprenticeable Occupations

Training in occupations, in the Virginia Apprenticeable Occupations list (beginning on page 23), is based on supply and demand. The economy, labor supply, and demand for a given occupation and location, as well as other factors, determine the extent to which apprentices are needed. The list reflects occupations in which on-the-job training and related classroom instruction have been set up by an employer in that specific occupation.

In all registered apprenticeship programs, the decision to sponsor an apprentice rests with the employer, who is considered the *sponsor*, and is registered and approved by the Virginia Apprenticeship Council.

A word of caution to interested persons: in a tight economy, apprenticeships in some occupations may not be available. During these periods, openings may be difficult to find and there may be a waiting period before entry into a particular program. In addition, the availability of related instruction will be determined by the market needs of each region of the state.

Current Recognized Apprenticeable Occupations in the Commonwealth of Virginia

DOT Code	Title Description	Terms (Years)
860.381-010	Acoustical Carpenter	4
637.261-010	Air-Conditioning Installer-Service, Window Unit	3
806.361-066	Aircraft Mechanic, Plumbing & Hydraulics	4
621.281-014	Airframe-and-Power-Plant Mechanic	4
621.261-010	Airplane Inspector	3
785.261-010	Alteration Tailor	4
723.584-010	Appliance Repairer (Any Industry)	3
828.381-018	Assembler, Electromechanical	4
633.261-010	Assembly Technician	2
651.585.010	Assistant-Press Operator	2
729.281-010	Audio-Video Repairer	2
807.381-010	Automobile-Body Repairer	4
620.261-010	Automobile Mechanic	4
620.261-014	Automobile Tester	4
780.381-010	Automobile Upholsterer	3
639.281-010	Aviation Support Equipment Repairer	4
823.261-026	Avionics Technician	4
526.381-010	Baker (Bakery Products)	3
313.381-010	Baker (Hotel & Restaurant)	3
313.131-010	Baker, Head	3
330.371-010	Barber	1½
653.685-010	Bindery Worker (Printing & Publishing)	4
019.261-010	Biomedical Equipment Technician	4
610.381-010	Blacksmith	4
979.682-010	Blocker I (Printing & Publishing)	4
860.361-010	Boatbuilder, Wood	4
805.361-010	Boiler House Mechanic	3
860.382-010	Boiler Operator	4
805.261-014	Boilermaker I	4
977.381-010	Bookbinder	5
210.382-014	Bookkeeper	2
753.381-010	Bootmaker, Hand (Rubber Goods)	1
183.167-010	Brewing Director	4
861.381-014	Bricklayer (Brick & Tile)	4
861.381-018	Bricklayer (Construction)	3
660.280-010	Cabinetmaker	4
003.167-010	Cable Engineer, Outside Plant	4
829.361-010	Cable Splicer	4

DOT Code	Title Description	Terms (Years)
019.281-010	Calibration Laboratory Technician	4
714.281-014	Camera Repairer	4
739.381-010	Canvas Worker	3
860.381-022	Carpenter (Construction)	4
860.281-010	Carpenter, Maintenance	4
860.381-042	Carpenter, Rough	4
860.281-014	Carpenter, Ship	4
844.364-010	Cement Mason	2
313.131-014	Chef (Hotel & Restaurant)	2
359.677-018	Child Care Development Specialist	1
899.364-010	Chimney Repairer	1
558.382-030	Chlorinator Operator	1
955.382-010	Clarifying Plant Operator	1
381.687-014	Cleaner, Commercial or Institution	1
653.382-014	Collating Machine Operator	1
627.261-010	Composing Room Machinist	6
973.381-010	Compositor	4
828.281-026	Computer Environmental Control Installer	4
213.382-010	Computer Peripheral Equipment Operator	1
869.131-014	Concreting Supervisor	4
620.261-022	Construction Equipment Mechanic	4
869.664-014	Construction Worker I	1
712.381-014	Contour Wire Specialist, Denture	4
315.361-010	Cook (Any Industry)	3
313.361-014	Cook (Hotel & Restaurant)	3
313.381-026	Cook, Pastry	2
862.281-010	Coppersmith (Ship/Boat Manufacturing)	4
332.271-010	Cosmetologist	2
045.107-010	Counselor	2
780.684-046	Cushion Builder	1
959.361-010	Customer Service Representative (Utilities)	3
651.362-010	Cylinder-Press Operator	4
079.361-018	Dental Assistant	1
829.261-014	Dental Equipment Installer and Servicer	3
712.381-018	Dental Laboratory Technician	3
017.261-022	Detailer, Furniture	4
601.280-014	Die Maker, Trim	4
625.281-010	Diesel Mechanic	4
891.131-010	Dock Supervisor	4
001.261-010	Drafter, Architectural	3
005.281-010	Drafter, Civil	4
017.261-026	Drafter, Commercial	4

DOT Code	Title Description	Term (Years)
017.261-030	Drafter, Detail	4
003.281-010	Drafter, Electrical	4
003.281-014	Drafter, Electronic	4
014.281-010	Drafter, Marine	4
007.281-010	Drafter, Mechanical	4
842.361-030	Dry-wall Applicator (Construction)	2
806.281-010	Dynamometer Tester, Motor	2
824.281-014	Electric Distribution Checker	2
821.361-014	Electric Meter Installer I	4
729.281-014	Electric Meter Repairer	4
821.381-010	Electric Meter Tester	4
721.281-018	Electric Motor Repairer	4
723.381-010	Electrical Appliance Repairer	3
827.261-010	Electrical Appliance Servicer	3
609.380-010	Electrical Discharge Machine Set-up Operator	4
729.281-026	Electrical Instrument Repairer	3
003.161-010	Electrical Technician	4
825.261-018	Electrician, Aircraft	4
824.261-010	Electrician (Construction)	4
829.261-018	Electrician, Maintenance	4
820.261-018	Electrician, Substation	3
710.281-018	Electromechanical Technician	3
726.381-014	Electronic Equipment Repairer	2
828.261-022	Electronics Mechanic	4
003.161-014	Electronics Technician	4
825.261-014	Elevator Examiner and Adjuster	4
825.281-030	Elevator Repairer	4
604.380-018	Engine-Lathe Set-up Operator	4
007.161-018	Engineering Assistant, Mechanical Equipment	4
979.382-014	Engraver, Machine (Printing & Publishing)	4
651.382-010	Engraving-Press Operator	3
641.380-010	Envelope Folding Machine Adjuster	3
637.261-014	Environmental Control System Installer	4
019.261-014	Estimator and Drafter	4
971.381-014	Etcher, Photoengraving	4
809.381-010	Fabricator Assembler, Metal Products	4
624.281-010	Farm Equipment Mechanic I	3
373.364-010	Fire Fighter (Any Industry)	3
373.663-010	Fire Fighter, Crash, Fire, & Rescue (Air Transport)	1
373.367-010	Fire Inspector (Any Industry)	4
864.481-010	Floor Layer	3
142.081-010	Floral Designer	1

DOT Code	Title Description	Term (Years)
653.382-010	Folding Machine Operator (Printing & Publishing)	2
452.364-010	Forest Technician	4
040.167-010	Forester, Aide	4
519.687-022	Foundry Worker, General	1
625.281-022	Fuel Injection Servicier	4
142.061-022	Furniture Designer	4
763.381-010	Furniture Finisher	3
780.381-018	Furniture Upholsterer	4
637.261-018	Gas Appliance Servicier	3
865.684-010	Glass Installer (Automotive)	4
865.381-010	Glazier (Construction)	3
141.061-018	Graphic Designer	1
603.280-014	Grinder Operator, Surface Tool	4
603.280-018	Grinder Operator, Tool	4
603.280-022	Grinder Set-up Operator, Internal	4
603.280-026	Grinder Set-up Operator, Jig	4
632.281-010	Gunsmith	4
504.382-014	Heat Treater I	4
040.061-038	Horticulturist	3
321.137-010	Housekeeper (Hotel & Rst., Medcl Svc., Rl. Estate)	2
631.261-010	Hydroelectric Machinery Mechanic	3
141.061-022	Illustrator	4
168.167-030	Inspector, Building	3
168.267-054	Inspector, Industrial Waste	2
619.261-010	Inspector, Metal Fabricating	4
168.287-014	Inspector, Quality Assurance	3
619.381-010	Inspector (Steel & Related)	2
600.280-010	Instrument Maker	4
710.281-026	Instrument Mechanic	4
710.281-030	Instrument Technician	4
003.261-010	Instrumentation Technician	4
863.364-014	Insulation Worker	2
700.281-010	Jeweler	4
860.381-050	Joiner (Ship/Boat Manufacturing)	4
689.260-026	Knitting Machine Fixer	4
018.167-018	Land Surveyor	4
406.687-010	Landscape Specialist	1
842.361-010	Lather	3
809.281-010	Lay-out Worker I	4
201.362-010	Legal Secretary	2
821.361-018	Line Erector	3
822.381-014	Line Installer-Repairer	4

DOT Code	Title Description	Term (Years)
821.361-026	Line Repairer	4
972.381-010	Lithographic Platemaker	4
709.281-010	Locksmith	4
661.281-010	Loft Worker	4
019.167-010	Logistics Engineer	4
616.380-018	Machine Operator I	1
609.682-022	Machine Operator, Centrifugal Control Switches	2
638.261-030	Machine Repairer, Maintenance	4
600.380-018	Machine Set-up Operator	2
600.360-014	Machine Setter (Machine Shop)	4
600.280-034	Machinist, Automotive	4
600.260-022	Machinist, Experimental	4
627.261-022	Machinist, Linotype	4
600.280-022	Machinist (Machine Shop)	4
623.281-030	Machinist, Outside	4
669.380-014	Machinist, Wood	4
600.280-042	Maintenance Machinist	4
638.281-014	Maintenance Mechanic (Any Industry)	4
630.261-010	Maintenance Mechanic, Compressed-Gas Plant	4
822.281-018	Maintenance Mechanic, Telephone	3
899.381-010	Maintenance Repairer, Building	3
899.261-014	Maintenance Repairer, Industrial	4
891.137-010	Maintenance Supervisor (Any Industry)	4
189.167-022	Manager, Department (Any Industry)	4
187.167-106	Manager, Food Service (Hotel & Rest., Persnl Svc.)	3
166.117-018	Manager, Personnel	2
185.167-046	Manager, Retail Store	3
331.674-010	Manicurist	1
861.381-030	Marble Setter	3
221.167-014	Material Coordinator	2
019.061-014	Materials Engineer	5
316.681-010	Meat Cutter (Hotel & Restaurant)	2
316.684-018	Meat Cutter (Retail Trade/Wholesale Trade)	3
620.281-050	Mechanic, Industrial Truck	4
007.161-026	Mechanical-Engineering Technician	4
079.362-010	Medical Assistant	2
201.362-014	Medical Secretary	1
619.361-014	Metal Fabricator	4
011.261-010	Metallurgical Technician	2
025.062-010	Meteorologist	3
638.281-018	Millwright	4
709.381-014	Model Builder (Furniture)	4

DOT Code	Title Description	Term (Years)
693.380-010	Model Maker (Clock & Watch)	4
600.260-018	Model Maker, Firearms	4
601.280-030	Mold Maker, Die-casting & Plastic Molding	4
518.361-010	Molder (Aircraft Mfg., Concrete Prod., Foundry)	4
665.682-018	Molder Operator	1
623.281-038	Motorboat Mechanic	3
011.261-018	Nondestructive Tester	1
609.362-010	Numerical Control Machine Operator	4
355.674-014	Nurse Assistant	1
079.374-014	Nurse, Licensed Practical	1
359.677-018	Nursery School Attendant	1
633.281-018	Office Machine Servicer	3
651.682-014	Offset Duplicating Machine Operator	1
651.382.042	Offset-Press Operator I/Lithographic Press Oper.	4
651.685-018	Offset-Press Operator II	1
862.281-018	Oil-Burner Servicer and Installer	2
859.683-010	Operating Engineer	3
716.280-014	Optician	5
299.361-010	Optician, Dispensing II	3
249.362-026	Order Clerk (Clerical)	1
632.261-018	Ordnance Artificer	3
809.381-022	Ornamental Iron Worker	3
840.381-010	Painter (Construction)	3
840.381-018	Painter, Shipyard	3
970.381-026	Painter, Sign	4
845.381-014	Painter, Transportation Equipment	3
781.361-014	Patternmaker (Furniture, Garment, Text. Prod.)	3
693.281-018	Patternmaker, Metal, Bench	5
661.281-022	Patternmaker, Wood	5
074.381-010	Pharmacist Asst. (Military)	1
971.381-022	Photoengraver	5
972.382-014	Photographer, Lithographic	5
143.062-022	Photographer, Motion Picture	4
971.382-014	Photographer, Photoengraving	6
143.062-030	Photographer, Still	3
730.281-038	Piano Technician	4
863.381-014	Pipe Coverer & Insulator	4
862.281-022	Pipe Fitter (Construction)	5
862.261-010	Pipe Fitter (Ship)	4
659.360-010	Plate Finisher	6
651.362-018	Platen-Press Operator (Printing & Publishing)	4
500.380-010	Plater (Electroplating)	3

DOT Code	Title Description	Term (Years)
862.381-030	Plumber (Construction)	4
375.263-014	Police Officer I	2
243.367-014	Post Office Clerk (Government Service)	2
952.382-018	Power Plant Operator (Utilities)	4
651.382-026	Printer, Plastic	4
979.382-018	Printer (Printing & Publishing)	1
972.281-010	Process Artist (Printing & Publishing)	4
972.281-022	Process Stripper (Printing & Publishing)	4
221.167-018	Production Coordinator	2
712.381-038	Prosthetics Technician	4
822.361-018	Protective Signal Installer	4
822.361-022	Protective Signal Repairer	3
355.377-014	Psychiatric Aide	1
630.281-018	Pump Servicer	3
914.382-014	Pumper Gager (Chemical, Petroleum Ref.)	3
162.157-038	Purchasing Agent (Prof. & Kin.)	4
012.261-014	Quality Control Technician (Professional & Kin.)	2
193.262-026	Radio Station Operator (Aircraft Manufacturing)	4
194.362-010	Recording Engineer	2
552.362-018	Recovery Operator (Paper & Pulp)	1
637.261-026	Refrigeration Mechanic (Any Industry)	4
637.381-014	Refrigeration Unit Repairer	3
626.361-010	Repairer, Welding, Brazing & Burning Machines	4
002.261-014	Research Mechanic (Aircraft Manufacturing)	4
970.381-030	Retoucher, Photoengraving	5
921.260-010	Rigger (Any Industry)	3
806.261-014	Rigger (Ship/Boat Manufacturing)	2
191.117-046	Right-of-way Agent	4
866.381-010	Roofer	3
651.362-026	Rotogravure Press Operator	4
781.384-018	Sail Cutter	1
272.357-010	Sales Representative, Animal Feed Products	2
279.357-062	Salesperson, Parts (Retail & Wholesale Trade)	2
633.281-026	Scale Mechanic	4
979.684-034	Screen Printer (Any Industry)	2
201.362-030	Secretary (Clerical)	2
787.682-046	Sewing Machine Operator (Any Industry)	1
639.281-018	Sewing Machine Repairer	3
804.281-010	Sheet Metal Worker	4
806.381-046	Shipfitter	4
860.381-058	Shipwright	4
365.361-014	Shoe Repairer	3

DOT Code	Title Description	Term (Years)
788.381-014	Shoemaker, Custom	4
785.361-022	Shop Tailor	4
970.281-022	Sign Writer, Hand	1
625.281-034	Small Engine Mechanic	2
829.281-022	Sound Technician	3
822.261-022	Station Installer & Repairer	4
950.382-026	Stationary Engineer	4
974.382-014	Stereotyper	6
219.387-030	Stock Control Clerk	1
861.381-038	Stonemason	3
824.381-010	Street Light Servicer	4
971.281-022	Stripper Lithographic I	5
972.381-022	Stripper Lithographic II	4
801.361-014	Structural Steel Worker	3
952.362-026	Substation Operator	4
976.137-014	Supervisor, Film Processing	2
018.167-034	Surveyor Assistant, Instruments	2
379.362-018	Telecommunicator	4
720.281-018	Television and Radio Repairer	4
861.664-014	Terrazzo Finisher	2
861.381-046	Terrazzo Worker	3
019.161-014	Test Technician (Professional & Kindred)	5
861.381-054	Tile Setter (Construction)	3
861.664-018	Tile Finisher	2
601.260-010	Tool and Die Maker	4
007.061-026	Tool Designer	4
601.280-042	Tool Maker	4
651.382-038	Transfer Operator (Printing & Publishing)	1
972.381-026	Transferrer (Printing & Publishing)	2
620.281-062	Transmission Mechanic	2
005.061-038	Transportation Engineer	4
630.281-038	Treatment Plant Mechanic	3
905.663-014	Truck Driver (Heavy)	1
807.281-010	Truck Body Builder	4
780.381-038	Upholsterer, Inside	3
929.137-022	Warehouse Supervisor	3
955.382-014	Waste Treatment Operator	2
955.362-010	Wastewater Treatment Plant Operator	3
715.281-010	Watch Repairer	4
862.137-018	Water and Sewer Systems Supervisor	4
954.382-014	Water Treatment Plant Operator (Waterworks)	4
651.362-030	Web Press Operator	4

DOT Code	Title Description	Term (Years)
810.384-014	Welder, Arc	4
819.384-010	Welder, Combination	4
819.361-010	Welder Fitter	4
801.382-010	Welding Machine Operator	3
011.261-014	Welding Technician	3

Apprenticeship Descriptions for Selected Programs

The apprenticeship occupations described on the following pages have been selected based on the number of participants currently in the programs.

- I. **Occupational Apprenticeship Title**
- II. **Codes:**
 - A. DOT Code: Dictionary of Occupational Titles code
 - B. OES Code: Occupational Employment Survey code
 - C. GOE Code: Guide to Occupational Exploration code
- III. **Alternate titles** that may be used in place of the primary DOT title.
- IV. **Specific vocational preparation time** refers to the time required to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job.
- V. **In the classroom:** hours of occupationally-related classroom training that is required by the Commonwealth of Virginia to attain certification.
- VI. **On the job:** the specific tasks the apprentice performs to accomplish the overall job purpose, as stated in the first sentence of the job description. The performance descriptions are taken from the *Dictionary of Occupational Titles*.
- VII. The **average length of time** that a qualified but inexperienced jobseeker could expect to spend **job hunting** before finding employment. This data is based on national averages and may vary depending on the economic/employment conditions in a given community.
- VIII. The **national average salary** is based on the *Occupational Outlook Handbook* pay ranges.

Automobile Body Repairer

DOT Code: 807.381-010

OES Code: 85305

GOE Code: 05.05.06

Alternate titles: Automobile Body Worker; Body Line Finisher; Body Repairer, Bus; Dent Remover; Door Repairer, Bus; Metal Bumper; Metal Shrinker; Metal Worker; Touch-up Finisher, Metal.

Specific vocational preparation time period averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs damaged bodies and body parts of motor vehicles, such as automobiles, buses, and light trucks according to repair manuals, using handtools and power tools.

Removes upholstery, accessories, electrical, and hydraulic window-and-sea operating equipment, and trim to gain access to vehicle body and fenders.

Positions dolly block against surface of dented area and beats opposite surface to remove dents, using hammer.

Fills depressions with body filler, using putty knife.

Remove damaged fenders, panes and grills, using wrenches and cutting torch, and bolts or welds replacement parts in position, using wrenches or welding equipment.

Straightens bent automobile frames, using pneumatic frame-straightening machine.

Files, grinds and sands repaired surfaces, using power tools and handtools.

Refinishes repaired surfaces, using paint spray gun and sander.

Aims headlights, aligns wheels, and bleeds hydraulic brake system.

May paint surfaces after performing body repairs and be designated Automobile Body Repairer, Combination.

May repair or replace defective mechanical parts.

The average length of time it takes before finding employment is a couple of weeks.

The national average salary range is \$17,000 to \$20,000 per year.

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Automobile Mechanic

DOT Code: 620.261-010

OES Code: 85302

GOE Code: 05.05.09

Alternate title: Garage Mechanic.

Specific vocational preparation time period averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs and overhauls automobiles, buses, trucks, and other automotive vehicles.

Examines vehicle and discusses with customer or estimator the nature and extent of damage or malfunction.

Plans work procedure, using charts, technical manuals, and experience.

Raises vehicle, using hydraulic jack or hoist to gain access to mechanical units bolted to underside of vehicle.

Removes unit, such as transmission, engine, or differential, using wrenches and hoist.

Disassembles unit and inspects parts for wear, using micrometers, calipers, and thickness gauges.

Repairs or replaces parts, such as pistons, rods, gears, valves, and bearings, using mechanics handtools.

Overhauls or replaces carburetors, blowers, generators, distributors, starters and pumps.

Rebuilds parts, such as crankshafts and cylinder blocks, using lathers, shapers, drill presses, and welding equipment.

Rewires ignition system, lights and instrument panel.

Replaces and adjusts headlights, and installs and repairs accessories, such as radios, heaters, mirrors, and windshield wipers.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$17,000 to \$20,999 per year.

Baker (Hotel and Restaurant)

DOT Code: 313.381-010

OES Code: 65021

GOE Code: 05.10.08

Alternative titles: Baker, Bread; Bread Maker; Oven Tender.

Specific vocational preparation time period averages one to three years.

The average length of time it takes before finding employment in this field is a couple of weeks.

In the classroom:

Completion of the 144 hours of related classes at an approved institution. Specific vocational preparation time period averages one to two years.

The national average salary range is \$14,000 to \$16,999 per year.

On the job:

Prepares bread, rolls, muffins, and biscuits according to recipes.

Checks production schedule to determine variety and quantity of goods to bake. Measures ingredients, using measuring cups and spoons.

Mixes ingredients to form dough or batter by hand or using electric mixer.

Cuts dough into uniform portions with knife or divider.

Molds dough into loaves or desired shapes.

Places shaped dough in greased or floured pans.

Spreads or sprinkles topping, such as jelly, cinnamon and poppy seeds on specialties.

Places pans of dough in proof box to rise.

Inserts pans of raised dough in oven to bake, using peel.

Adjusts drafts or thermostatic controls to regulate oven temperature.

Removes baked goods from oven and places goods on cooling rack.

May bake pies, cakes, cookies, and other pastries.

Barber

DOT Code: 330.371-010

OES Code: 68002

GOE Code: 09.02.02

Alternative titles: Haircutter; Tonsorial Artist.

Specific vocational preparation time period averages one to two years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Provides customers with barbering services.

Cuts, shapes, trims and tapers hair, using clippers, comb, blow dryer and scissors.

Shapes hair contour on temple and neck, using razor.

Performs other tonsorial services, such as applying hairdressing or lotions, dyeing, shampooing, singeing, or styling hair and massaging face, neck or scalp.

Records service charge on ticket or receives payment.

Cleans work area and work tools.

Orders supplies.

May sell lotions, tonics, or other cosmetic supplies.

The average length of time it takes before finding employment in this field is from a few months to a year.

The national average salary range is below \$14,000 per year. Many barbers are self-employed.

Boilermaker

DOT Code: 805.261-014

OES Code: 89135

GOE Code: 05.05.06

Alternative titles: Boilermaker, Assembly and Erection.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Assembles, analyzes defects in, and repairs boilers, pressure vessels, tanks and vats in the field, following blueprints and using handtools and portable power tools and equipment.

Locates and marks reference points for columns or plates on foundation, using master straightedge, squares, transit and measuring tape and applying knowledge of geometry.

Attaches rigging or signals crane operator to lift parts to specified position.

Aligns structures or plate sections to assemble boiler frame, tanks or vats using plumb bobs, levels, wedges, dogs, or turnbuckles.

Hammers, flame-cuts, files, or grinds irregular edges of sections or structural parts to facilitate fitting edges together.

Bolts or arc-welds structures and sections together.

Positions drums and headers into supports and bolts or welds supports to frame.

Aligns water tubes and connects and expands ends to drums and headers, using tube expander.

Bells, beads with power hammer, or welds tube ends to ensure leak proof joints.

Bolts or welds casing sections, uptakes, stacks, baffles, and such fabricated parts such as chutes, air heaters, fan stands, feeding tube, catwalks, ladders, coal hoppers, and safety hatch to frame, using wrench.

Installs manholes, handholes, valves, gauges, and feedwater connection in drums to complete assembly of water tube boilers.

Assists in testing assembled vessels by pumping water or gas under specified pressure into vessel and observing instruments for evidence of leakage.

Repairs boilers or tanks in field by unbolting or flame cutting defective sections or tubes, straightening plates, using torch or jacks, installing new tubes, fitting and welding new sections and replacing worn lugs on bolts.

May rivet and caulk sections of vessels, using pneumatic riveting and caulking hammers.

May line firebox with refractory brick and asbestos rope and blocks.

May fabricate such parts as stacks, uptakes and chutes to adapt boiler to premises in which it is installed.

The average length of time it takes before finding employment in this field is a few months to a year.

The national average salary range is \$17,000 to \$20,999 per year.

Bricklayer

DOT Code: 861.381-018

OES Code: 87310

GOE Code: 05.05.01

Specific vocational preparation averages four to ten years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Lays building materials, such as brick, structural tile, and concrete cinder, glass, gypsum and terra cotta block to construct or repair walls, partitions, arches, sewers and other structures.

Measures distance from reference points and marks guidelines on working surface to lay out work.

Spreads soft bead of mortar that serves as base and binder for block, using trowel.

Applies mortar to end of block and positions block in mortar bed.

Taps block with trowel to level, align and embed in mortar, allowing specified thickness of joint.

Removes excess mortar from face of block, using trowel.

Finishes mortar between brick with pointing tool or trowel.

Breaks bricks to fit spaces too small for whole brick, using edge of trowel or brick hammer.

Determines vertical and horizontal alignment of courses, using plumb bob, gaugeline and level.

Fastens brick or terra cotta veneer to face of structures, with tie wires embedded in mortar between bricks, or in anchor holes in veneer brick.

May weld metal parts to steel structural members.

May apply plaster to walls and ceiling using trowel, to complete repair work.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$21,000 to \$27,999 per year.

Cabinetmaker

DOT Code: 660.280-010

OES Code: 89311

GOE Code: 05.05.08

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Sets up and operates variety of woodworking machines and uses various handtools to fabricate and repair wooden cabinets and high-grade furniture.

Studies blueprints or drawings of articles to be constructed or repaired, and plans sequence of cutting or shaping operations to be performed.

Marks outline or dimensions of parts on paper or lumber stock, according to blueprint or drawing specifications.

Matches materials for color, grain, or texture.

Sets up and operates woodworking machines, such as power saws, jointer, mortiser, tenoner, molder, and shaper, to cut and shape parts from woodstock.

Trims component parts of joints to ensure snug fit, using handtools, such as planes, chisels, or wood files.

Bores holes for insertion of screws or dowels by hand or using boring machine.

Glues, fits, and clamps parts and sub-assemblies together to form complete unit, using clamps or clamping machine.

Drives nails or other fasteners into joints at designated places to reinforce joints.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$21,000 to \$27,999 per year.

Carpenter

DOT Code: 860.381-022

OES Code: 87110

GOE Code: 05.05.02

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Constructs, erects, installs, and repairs structures and fixtures of wood, plywood and wallboard, using carpenter's handtools and power tools, and conforming to local building codes.

Studies blueprints, sketches, or building plans for information pertaining to type of material required, such as lumber or fiberboard, and dimension of structure or fixture to be fabricated.

Selects specified type of lumber or other materials.

Prepares layout, using rule, framing square and calipers.

Marks cutting and assembly lines on materials, using pencil, chalk and marking gauge.

Shapes materials to prescribed measurements, using saws, chisels and planes.

Assembles cut and shaped materials and fastens them together with nails, dowel pins, or glue.

Verifies trueness of structure with plumb bob and carpenter's level.

Erects framework for structures and lays subflooring.

Builds stairs and lays out and installs partitions and cabinet work.

Covers subfloor with building paper to keep out moisture and lays hardwood, parquet and wood-strip-block floors by nailing floors to subfloor or cementing them to mastic or asphalt base.

Applies shock-absorbing, sound-deadening and decorative paneling to ceilings and walls.

Fits and installs prefabricated window frames, doors, doorframes, weather stripping, interior and exterior trim and finish hardware, such as locks, letter-drops and kickplates.

Constructs forms and chutes for pouring concrete.

Erects scaffolding and ladders for assembling structures above ground level.

May weld metal parts to steel structural members.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$21,000 to \$27,999 per year.

Child Care Development Specialist

DOT Code: 359.677-010

OES Code: 68038

GOE Code: 10.03.03

Specific vocational preparation averages three to six months.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Organizes and leads activities of pre-kindergarten children in nursery schools or in playrooms operated for patrons of theaters, department stores, hotels, and similar organizations.

Helps children remove outer garments.

Organizes and participates in games.

Reads to children.

Teaches them simple painting, drawing, handwork, songs, and similar activities.

Directs children in eating, resting, and toileting.

Helps children develop habits of caring for own clothing and picking up and putting away toys and books.

Maintains discipline.

May serve meals and refreshments to children and regulate rest periods.

May assist in preparing food and cleaning quarters.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is below \$14,000 per year.

Computer-Peripheral-Equipment Operator

DOT Code: 213.382-010

OES Code: 56014

GOE Code: 07.06.01

Specific vocational preparation averages three to six months.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Operates computer peripheral equipment, such as printer, plotter, computer output microfiche machine, and document reader-sorter to transfer data to and from computer and to convert data from one format to another.

Reads instructions and schedule, such as schedule of documents to be printed, or receives instructions from supervisor orally, to determine work for shift.

Mounts reels and cartridges of magnetic in tape drives, loads paper in printer, loads checks or other documents in magnetic ink reader-sorter or optical character reader, sets guides, keys, and switches, enters commands into computer, using computer terminal, and performs other tasks, to start and operate peripheral machines.

Observes machine operation and error lights on machines to detect malfunction.

Observes materials printed for defects, such as creases and tears.

Removes faulty materials and notifies supervisor of error or machine stoppage.

Unloads and labels magnetic tape for delivery to other worker or tape library.

May separate, sort and distribute output.

May clean and supply equipment operated with paper, ink, film, developing solution and other materials.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$17,000 to \$20,999 per year.

Cook (Hotel and Restaurant)

DOT Code: 313.361-014

OES Code: 65026

GOE Code: 05.05.17

Alternate title: Cook, Restaurant.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Prepares, seasons and cooks soups, meats, vegetables, desserts and other foodstuff for consumption in eating establishments.

Reads menu to estimate food requirements and orders food from supplier or procures food from storage.

Adjusts thermostat controls to regulate temperature of ovens, broilers, grills, roasters and steam kettles.

Measures and mixes ingredients according to recipe, using variety of kitchen utensils and equipment, such as blenders, mixers, grinders, slicers and tenderizers, to prepare soups, salads, gravies, desserts, sauces and casseroles.

Bakes, roasts, broils and steams meats, fish, vegetables and other foods.

Adds seasoning to foods during mixing or cooking according to personal judgment and experience.

Observes and tests foods being cooked by tasting, smelling, and piercing with fork to determine that it is cooked.

Carves meats, portions food on serving plates, adds gravies and sauces and garnishes servings to fill orders.

May supervise other cooks and kitchen employees.

May wash, peel, cut and shred vegetables and fruits to prepare them for use.

May butcher chickens, fish and shellfish. May cut, trim and bone meat prior to cooking.

May bake bread, rolls, cakes and pastry. May price items on menu.

The average length of time it takes before finding employment in this field may be a couple of weeks.

The national average salary range is below \$14,000 per year.

Cosmetologist

DOT Code: 332.271-010

OES Code: 68005

GOE Code: 09.02.01

Alternate titles: Beautician; Beauty Culturist; Beauty Operator; Cosmetician.

Specific vocational preparation averages one to two years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Provides beauty services for customers.

Analyzes hair to ascertain condition of hair.

Applies bleach, dye or tint, using applicator or brush, to color customer's hair, first applying solution to portion of customer's skin to determine if customer is allergic to solution.

Shampoos hair and scalp with water, liquid soap, dry powder, or egg and rinses hair with vinegar, water, lemon or prepared rinses.

Styles hair by blowing, cutting, trimming, and tapering, using clippers, scissors, razors, and blow-wave gun.

Suggests coiffure according to physical features of patron and current styles or determines coiffure from instructions of patron.

Applies water or waving solutions to hair and winds hair around rollers or pin curls and finger-waves hair.

Sets hair by blow-dry or natural-set or presses hair with straightening comb.

Suggests cosmetics for conditions, such as dry or oily skin.

Applies lotions and creams to customer's face and neck to soften skin and lubricate tissues.

Performs other beauty services, such as massaging face or neck, shaping and coloring eyebrows or eyelashes, removing unwanted hair, applying solutions that straighten hair or retain curls or waves in hair, and waving or curling hair.

Cleans, shapes, and polishes fingernails and toenails.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$14,000 to \$16,999 per year.

Drafter, Architectural

DOT Code: 001.261-010

OES Code: 22512

GOE Code: 05.03.02

Specific vocational preparation averages one to two years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Prepares detailed drawings of architectural designs and plans for buildings, according to specifications, sketches and rough drafts provided by architect.

Draws rough and detailed sketches, drawings and plans to scale.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$21,000 to \$27,999 per year.

Electrician

DOT Code: 824.261-010

OES Code: 87202

GOE Code: 05.05.05

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Plans layout, installs, and repairs wiring, electrical fixtures, apparatus and control equipment.

Plans new or modified installations to minimize waste of materials, provide access for future maintenance, and avoid unsightly, hazardous, and unreliable wiring, consistent with specifications and local electrical codes.

Prepares sketches showing location of wiring and equipment, or follows diagrams or blueprints, ensuring that concealed wiring is installed before completion of future walls, ceilings and flooring.

Measures, cuts, bends, threads, assembles and installs electrical conduit, using tools, such as hacksaw, pipe threader and conduit bender.

Pulls wiring through conduit.

Splices wires by stripping insulation from terminal leads, using knife or pliers, twisting or soldering wires together and applying tape or terminal caps.

Connects wiring to lighting fixtures and power equipment, using handtools.

Installs control and distribution apparatus, such as switches, relays, and circuit-breaker panels, fastening in place with screws or bolts, using handtools and power tools.

Connects power cables to equipment, such as electric range or motor, and installs grounding leads.

Tests continuity of circuit to ensure electrical compatibility and safety of components, using testing instruments, such as ohmmeter, battery and buzzer, and oscilloscope.

Observes functioning of installed equipment or system to detect hazards and need for adjustments, relocation, or replacement.

May cut and weld steel structural members, using flame-cutting and welding equipment.

Virginia electrician's license required.

The average length of time it takes before finding employment in this field may be a couple of weeks.

The national salary range is \$28,000 per year and above.

Electrician, Maintenance

DOT Code: 829.261-018

OES Code: 87202

GOE Code: 05.05.05

Alternate title: Electrical Repairer.

Specific vocational preparation averages four to ten years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs and repairs electrical systems, apparatus, and electrical components of industrial machinery and equipment, following electrical code, manuals, schematic diagrams, blueprints and other specifications, using handtools, power tools and electrical and electronic test equipment.

Installs power supply wiring and conduit for newly installed machines and equipment, such as robots, conveyors, and programmable controllers, following electrical code and blueprints, using handtools and voltage tester.

Connects power supply wires to machines and equipment, and connects cables and wires between machines and equipment, following manuals, schematic diagrams and blueprints, using handtools and test equipment.

Diagnoses malfunctioning apparatus, such as transformers, motors, and lighting fixtures, using test equipment and replaces damaged or broken wires and cables, using handtools.

Tests malfunctioning machinery, using test equipment, and discusses malfunction with other maintenance workers, to diagnose malfunction.

Replaces faulty electrical components of machine, such as relays, switches, and motors, and positions sensing devices, using handtools.

Diagnoses and repairs or replaces faulty electronic components, such as printed circuit boards, using electronic test equipment and handtools.

Replaces electric motor bearings and rewires motors.

May push buttons and press keys on robot controller, teach pendant, and programmable controller to program automated machinery, such as robots, to operate automated machinery, to test for malfunctions, and to verify repairs.

May plan layout of wiring and install wiring, conduit, and electrical apparatus in buildings.

May diagnose and replace faulty mechanical, hydraulic, and pneumatic components of machines and equipment.

Virginia electrician's license required.

The average length of time it takes before finding employment in this field may be a couple of weeks.

The national salary range is \$21,000 to \$27,999 per year.

Electromechanical Technician

DOT Code: 710.281-018

OES Code: 93111

GOE Code: 05.05.11

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Fabricates, tests, analyzes and adjusts precision electromechanical instruments, such as accelerometers, altimeters, electro-medical instruments, gyroscopes, temperature probes and x-ray inspection systems, according to blueprints and other specifications, using handtools, metalworking machines and precision measuring and testing instruments.

Operates metal working machines, such as bench lathe, milling machine, punch press and drill press to fabricate housings, fittings, jigs and fixtures and verifies dimensions, using precision measuring instruments.

Assembles wires, insulation, and electrical components, such as resistors and capacitors, following method layouts, using fixtures, binocular microscope, soldering equipment, tweezers, and handtools.

Installs electrical assemblies and hardware in housing, using handtools and soldering equipment.

Tests assembled instruments for circuit continuity and operational reliability, using test instruments, such as multi-meter, oscilloscope, oscillator, electronic voltmeter, and bridge.

Analyzes test results and repairs or adjusts instruments according to analysis.

Records test results and writes report on fabrication techniques used.

May calibrate instruments according to specifications.

May specialize in assembly of prototype or production instruments.

The average length of time it takes before finding employment in this field may be a couple of weeks.

The national salary range is \$17,000 to \$20,999 per year.

Electronics Mechanic

DOT Code: 828.261-022

OES Code: 85705

GOE Code: 05.05.10

Alternate titles: Communication Technician; Electronics-Equipment Mechanic; Electronics Specialist; Electronics-System Mechanic; Electronics Technician; Maintenance Engineer.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs electronic equipment, such as computers, industrial controls, audio and video systems, radar systems, telemetering and missile control systems, transmitters, antennas, and servomechanisms, following blueprints and manufacturers' specifications, and using handtools and test instruments.

Converses with equipment operators to ascertain problems with equipment before breakdown, and to determine if breakdown is due to human error or mechanical problems.

Tests faulty equipment and applies knowledge of functional operation of electronic units and systems to diagnosis cause of malfunction.

Tests electronic components and circuits to locate defects, using oscilloscopes, signal generators, ammeters, and voltmeters.

Replaces defective components and wiring and adjusts mechanical parts, using handtools and soldering iron.

Aligns, adjusts, and calibrates equipment according to specifications.

Calibrates testing instruments.

Maintains records of repairs, calibrations, and tests.

May enter information into computer to copy program from one electronic component to another, or to draw, modify or to store schematics, applying knowledge of software package used.

May install equipment in industrial or military establishments and in aircraft and missiles.

May operate equipment, such as communication equipment or missile control systems in ground and flight test, and be required to hold license from governmental agency.

The average length of time it takes before finding employment in this field may be a matter of days.

The national salary range is \$21,000 to \$27,999 per year.

Furniture Designer

DOT Code: 142.061-022

OES Code: 34038

GOE Code: 01.02.03

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Designs furniture for manufacture, according to knowledge of design trends, offerings of competition, production costs, capability of production facilities and characteristics of company's market.

Confers with production, design, and sales personnel to obtain design suggestions and customer orders.

Evaluates orders and proposals to determine feasibility of producing item.

Sketches freehand design of article.

Obtains approval from customer, design committee or authorized company officials, and originates scale or full-size drawing, using drawing instruments.

Prepares itemized production requirements to produce item.

Traces drawing on material for use in production of blueprints, using drawing instruments.

Prepares or directs preparation of blueprints containing manufacturing specifications, such as dimensions, kind of wood, and upholstery fabrics to be used in manufacturing article.

Attends staff conference with plant personnel to explain and resolve production requirements.

May design and prepare detailed drawings of jigs, fixtures, forms, or tools required to be used in production.

May plan modification for completion of furniture to conform to changes in design trends and increase customer acceptance.

May design custom pieces or styles according to specific period or country.

May build or oversee construction of models or prototypes.

May design fixtures and equipment, such as counters and display cases.

The average length of time it takes before finding employment in this field is a few months to a year.

The national salary range is \$17,000 to \$20,999 per year.

Furniture Upholsterer

DOT Code: 780.381-018

OES Code: 89508

GOE Code: 05.05.15

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs and rebuilds upholstered furniture, using handtools and knowledge of fabrics and upholstery methods.

Removes covering, webbing, and padding from seat, arms, back, and sides of workpiece, using tack puller, chisel, and mallet.

Removes defective springs by cutting cords or wires that hold them in place.

Replaces webbing and springs or reties springs.

Measures and cuts new covering material.

Installs material on inside of arms, back, and seat, and over outside back and arms of wooden frame.

Tacks or sews ornamental trim, such as braid and buttons, to cover or frame.

May refinish wooden surfaces.

May upholster cornices.

May repair seats, carpets, curtains, mattresses, and window shades of railroad coaches and sleeping cars.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$14,000 to \$16,999 per year.

Glazier

DOT Code: 865.381-010

OES Code: 87811

GOE Code: 05.10.01

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs glass in windows, skylights, store fronts, and display cases, or on surfaces such as building fronts, interior walls, ceilings, and tabletops.

Marks outline or pattern on glass, and cuts glass, using glasscutter.

Breaks off excess glass by hand or with notched tool.

Fastens glass panes into wood sash with glazier's points, and spreads and smoothes putty around edge of pane with knife to seal joints.

Installs mirrors or structural glass on building fronts, walls, ceilings, or tables, using mastic, screws, or decorative molding.

Bolts metal hinges, handles, locks, and other hardware to prefabricated glass doors.

Sets glass doors into frame and fits hinges.

May install metal window and door frames into which glass panels are to be fitted.

May press plastic adhesive film to glass or spray glass with tinting solution to prevent light glare.

May install stained glass windows.

May assemble and install metal-framed glass enclosures for showers.

The average length of time before finding employment in this field is a few months.

The national salary range is \$17,000 to \$20,999 per year.

Heating and Air-Conditioning System Installer/Service

DOT Code: 637.261-014

OES Code: 85902

GOE Code: 05.05.09

Alternate titles: Air-Conditioning Mechanic; Environmental-Control-System Installer-Service; Heating and Air-Conditioning Mechanic; Heating Mechanic.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs, services, and repairs environmental control systems in residences, department stores, office buildings, and commercial establishments, utilizing knowledge of refrigeration theory, pipefitting, and structural layout.

Mounts compressor and condenser units on platform or floor, using handtools, following blueprints or engineering specifications.

Fabricates, assembles and installs ductwork and chassis parts, using portable metalworking tools and welding equipment.

Installs evaporator unit in chassis or in air duct system, using handtools.

Cuts and bends tubing to correct length and shape, using cutting and bending equipment and tools.

Joins tubing or pipe to various refrigerating units by means of sleeves, couplings or unions and solders joints, using torch, forming complete circuit for refrigerant.

Installs expansion and discharge valves in circuit.

Connects motors, compressors, temperature controls, humidity controls, and circulating-ventilation fans to control panels and connects control panels to power source.

Installs air and water filters in completed installation.

Injects small amount of refrigerant into compressor to test systems, and adds freon gas to build up prescribed operating pressure.

Observes pressure and vacuum gauges and adjusts controls to ensure efficient operation.

Tests joints and connections for gas leaks, using gauges or soap-and-water solution.

Wraps pipes in insulation batting and secures them in place with cement or wire bands.

Replaces defective breaker controls, thermostats, switches, fuses, and electrical wiring to repair installed units, using electrician's handtools and test equipment.

May install, repair, and service air conditioners, ranging from fifteen to twenty tons cooling capacity, in warehouses and factory buildings.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$21,000 to \$27,999 per year.

Instrument Mechanic

DOT Code: 710.281-026

OES Code: 85905

GOE Code: 05.05.10

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs, repairs, maintains, and adjusts indicating, recording, telemetering, and controlling instruments and test equipment used to control and measure variables, such as pressure, flow, temperature, motion, force, and chemical composition, using precision instruments and handtools.

Disassembles malfunctioning instruments or test equipment, such as bargraphs, electrical ovens, multimeters, environmental cabinets, and weatherometers, and examines and tests mechanisms and circuitry for defects.

Replaces or repairs defective parts, using handtools.

Reassembles instrument or tests equipment, and tests assembly for conformance to specifications, using instruments, such as potentiometer, resistance bridge, man-ometer, and pressure gauge.

Inspects instruments and tests equipment periodically and adjusts calibration to ensure functioning within specified standards.

May calibrate instruments or test equipment according to established standards.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$21,000 to \$27,999 per year.

Insulation Worker

DOT Code: 863.364-014

OES Code: 87802

GOE Code: 05.10.01

Specific vocational preparation averages one to two years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Applies insulating material to exposed surfaces of structures, such as air ducts, hot and cold pipes, storage tanks, and cold storage rooms.

Reads blueprints and selects required insulation material (in sheet, tubular, roll form), such as fiberglass, foam rubber, styrofoam, cork or urethane, based on material's heat retaining or excluding characteristics.

Brushes adhesives on or attaches metal adhesive-backed pins to flat surfaces as necessary to facilitate application of insulation material.

Measures and cuts insulation material to specified size and shape for covering flat or round surfaces, using tape measure, knife, or scissors.

Fits, wraps, or attaches required insulation material around or to structure, following blueprint specifications.

Covers or seals insulation with preformed plastic covers, canvas strips, sealant, or tape to secure insulation to structure, according to type of insulation used and structure covered, using staple gun, trowel, paintbrush, or caulking gun.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$14,000 to \$16,999 per year.

Jeweler

DOT Code: 700.281-010

OES Code: 89123

GOE Code: 01.06.02

Alternate titles: Bench Worker; Jewelry Jobber; Jewelry Repairer.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Fabricates and repairs jewelry articles, such as rings, brooches, pendants, bracelets, and lockets.

Forms model of article from wax, or metal, using carving tools.

Place wax model in casting ring, and pours plaster into ring to form mold.

Inserts plaster mold in furnace to melt wax.

Casts metal model from plaster mold.

Forms mold of sand or rubber from metal model for casting jewelry.

Pours molten metal into mold, or operates centrifugal casting machine to cast article.

Cuts, saws, files, and polishes article, using handtools and polishing wheel.

Solders pieces of jewelry together, using soldering torch or iron.

Enlarges or reduces size of rings by sawing through band, adding or removing metal, and soldering ends together.

Repairs broken clasps, pins, rings, and other jewelry by soldering or replacing broken parts.

Reshapes and restyles old jewelry, following designs or instructions, using handtools and machines, such as jeweler's lathe and drill.

Smooths soldered joints and rough spots, using hand file and emery paper.

The average length of time it takes before finding employment in this field may be a few months.

The national salary range is \$28,000 per year and above.

Land Surveyor

DOT Code: 018.167-018

OES Code: 22310

GOE Code: 05.01.06

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Plans, organizes, and directs work of one or more survey parties engaged in surveying the earth's surface to determine precise location and measurements of points, elevations, lines, areas, and contours for construction, mapmaking, land division, titles, mining or other purposes.

Researches previous survey evidence, maps, deeds, physical evidence, and other records to obtain data needed for surveys.

Develops new data from photogrammetric records.

Determines methods and procedures for establishing or reestablishing survey control.

Keeps accurate notes, records, and sketches to describe and certify work performed.

Coordinates findings with work of engineering and architectural personnel, clients, and others concerned with project.

Assumes legal responsibility for work performed and is licensed by state.

The average length of time before finding employment in this field is within a couple of weeks.

The national salary range is \$21,000 to \$27,999 per year.

Legal Secretary

DOT Code: 201.362-010

OES Code: 55102

GOE Code: 07.01.03

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Prepares legal papers and correspondence of legal nature, such as summonses, complaints, motions and subpoenas, using typewriter, word processor or personal computer.

May review law journals and other legal publications to identify court decisions pertinent to pending cases and submit articles to company officials.

The average length of time before finding employment in this field is within a couple of weeks.

The national salary range is \$21,000 to \$27,999 per year.

Line Erector

DOT Code: 821.361-018

OES Code: 85723

GOE Code: 05.05.05

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Erects, maintains, and repairs wood poles and prefabricated light-duty metal towers, cable, and related equipment to construct transmission and distribution power lines used to conduct electrical energy between generating stations, substations, and consumers.

Directs and assists Ground Helpers in attaching crossarms, insulators, lightning arresters, switches, wire conductors, and auxiliary equipment to poles preparatory to erection, as instructed by Line Supervisor, and assists in erection of poles or towers and adjustment of guy wires.

Climbs erected poles or towers and installs equipment, such as transformers, which are ordinarily installed after poles are erected.

Strings wire conductors between erected poles with assistance of Ground Helpers and adjusts slack in conductors to compensate for contraction and elongation of conductors due to temperature variations, using winch.

Splices, solders, and insulates conductors and related wiring to join sections of power line, and to connect transformers and electrical accessories.

May trim trees and brush prior to new construction, during repair of damaged lines, or as part of routine maintenance.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$17,000 to \$20,999 per year.

Machinist

DOT Code: 600.280-022

OES Code: 89108

GOE Code: 05.05.07

Alternate titles: Machinist, First-Class; Machinist, General.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Sets up and operates conventional, special purpose, and computer numerical control (CNC) machines and machining centers to fabricate metallic and nonmetallic parts, and fits and assembles machined parts into complete units, applying knowledge of machine shop theory and procedures, shop mathematics, machine ability of materials, and layout techniques.

Studies blueprints, sketches, drawings, manuals, specifications or sample part to determine dimensions and tolerances of finished workpiece, sequence of operations, and setup requirements.

Measures, marks, and scribes dimensions and reference points on material or workpiece as guides for machining.

Selects, aligns, and secures holding fixtures, cutting tools, attachments, accessories, and materials or machines, such as mills, lathes, jig borers, grinders, and shapers.

Calculates and sets controls to regulate machining factors, feed, coolant flow, depth and angle of cut, or enters commands to retrieve, input, or edit computerized machine control media.

Starts and observes machine operation to detect malfunctions or out-of-tolerance machining and adjusts machine controls or control media as required.

Verifies conformance of finished workpiece to specifications, using precision measuring instruments.

Sets up and operates machine on trial run to verify accuracy of complete assembly, using jigs, fixtures, surface plate, surface table, handtools, and power tools.

Verifies dimensions and alignment of assembly, using measuring instruments, such as micrometers, height gauges, and gauge blocks.

May install machined replacement parts in mechanisms, machines, and equipment, and tests operation of unit to ensure functionality and performance.

May operate welding equipment to cut or weld parts.

May develop specifications from general description and draw sketch of part or product to be fabricated.

May confer with engineers, production personnel, programmers, or others to resolve machining or assembly problems.

May specialize in setting up and operating CNC machines and machining centers.

The average length of time before finding employment in this field is a few months.

The national salary range is \$21,000 to \$27,999 per year.

Maintenance Mechanic

DOT Code: 638.281-014

OES Code: 85109

GOE Code: 05.05.09

Alternate titles: Fixer; Machine-Maintenance Servicer; Machine Overhauler; Machine Repairer; Mechanical Adjuster; Repair Mechanic; Tool-and-Machine Maintainer.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs and maintains, in accordance with diagrams, sketches, operation manuals, and manufacturer's specifications, machinery and mechanical equipment, such as engines, motors, pneumatic tools, conveyor systems, and production machines and equipment, using handtools, power tools, and precision measuring and testing instruments.

Observes mechanical devices in operation and listens to their sounds to locate causes of trouble.

Dismantles devices to gain access to and remove defective parts, using hoists, cranes, handtools, and power tools.

Examines form and texture of parts to detect imperfections.

Inspects used parts to determine changes in dimensional requirements, using rules, calipers, micrometers, and other measuring instruments.

Adjusts functional parts of devices and control instruments, using handtools, levels, plumb bobs, and straightedges.

Repairs or replaces defective parts, using handtools and power tools.

Installs special functional and structural parts in devices, using handtools.

Starts devices to test their performance.

Lubricates and cleans parts.

May set up and operate lathe, drill press, grinder, and other metalworking tools to make and repair parts.

May initiate purchase order for parts and machines.

May repair electrical equipment.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national salary range is in the mid-range at \$17,000 to \$20,999 per year.

Maintenance Repairer, Building

DOT Code: 899.381-010

OES Code: 85132

GOE Code: 05.10.01

Alternate title: Building Repairer.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs and maintains physical structures of commercial and industrial establishments, such as factories, office buildings, apartment houses, and logging and mining constructions, using handtools and power tools.

Replaces defective electrical switches and other fixtures.

Paints structures, and repairs woodwork with carpenter's tools.

Repairs plumbing fixtures.

Repairs plaster and lays brick.

Builds sheds and other outbuildings.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$17,000 to \$20,999 per year.

Manicurists

DOT Code: 331.674-010

OES Code: 68008

GOE Code: 09.05.01

Specific vocational preparation averages one to three months.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Cleans, shapes, and polishes customer's fingernails and toenails.

Removes previously applied nail polish, using liquid remover and swabs.

Shapes and smooths ends of nails, using scissors, files, and emery boards.

Cleans customers' nails in soapy water, using swabs, files, and orange sticks.

Softens nail cuticles with water and oil, pushes back cuticles, using cuticle knife and trims cuticles, using scissors or nippers.

Whitens underside of nails with white paste or pencil.

Polishes nails, using powdered polish and buffer, or applies clear or colored liquid polish onto nails with brush.

May perform other beauty services such as shampooing, tinting, and curling hair.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$14,000 to \$16,999 per year.

Meat Cutter

DOT Code: 316.684-018

OES Code: 89803

GOE Code: 05.10.08

Alternate titles: Butcher; Salesperson, Meats.

Specific vocational preparation averages two to three years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Cuts and trims meat to size for display or as ordered by customer, using handtools and power equipment, such as grinder, cubing machine, and power saw.

Cleans and cuts fish and poultry.

May shape, lace, and tie meat cuts by hand, using boning knife, skewer, and twine to form roasts.

May place meat in containers to be wrapped by other workers.

May place meat on trays in display counter.

May clean work area.

May unload meat from delivery truck and store meat into refrigerator.

May wrap and weigh meat for customers and collect money for sales.

May inspect and grade meats.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$17,000 to \$20,999 per year.

Metal Fabricator

DOT Code: 619.361-014

OES Code: 91714

GOE Code: 05.05.06

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Fabricates and assembles structural metal products, such as framework or shells for machinery, ovens, tanks, stacks, and metal parts for buildings and bridges according to job order, verbal instructions, and blueprints.

Develops layout and plans sequence of operations, applying knowledge of trigonometry, stock allowances for thickness, machine and welding shrinkage and physical properties of metal.

Locates and marks bending and cutting lines onto workpiece.

Sets up and operates fabricating machines, such as brakes, rolls, shears, flame cutters, and drill presses.

Hammers, chips, and grinds workpiece to cut, bend, and straighten metal.

Preheats workpieces, using hand torch or furnace.

Positions, aligns, fits, and welds together parts.

Designs and constructs templates and fixtures.

Verifies conformance of workpiece to specifications, using square, ruler, and measuring tape.

May fabricate and assemble sheet metal products.

May set up and operate machine tools associated with fabricating shops, such as radial drill press, end mill, and edge planer.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$17,000 to \$20,999 per year.

Millwright

DOT Code: 638.281-018

OES Code: 85123

GOE Code: 05.05.06

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs machinery and equipment according to layout plans, blueprints, and other drawings in industrial establishment, using hoists, lift trucks, handtools, and power tools.

Reads blueprints and schematic drawings to determine work procedures.

Dismantles machines, using hammers, wrenches, crowbars, and other handtools.

Moves machinery and equipment, using hoists, dollies, rollers, and trucks.

Assembles and installs equipment, such as shafting, conveyors and tram rails, using handtools and power tools.

Constructs foundation for machines, using handtools and building materials, such as wood, cement, and steel.

Aligns machines and equipment, using hoists, jacks, handtools, squares, rules, micrometers, and plumb bobs.

Assembles machines, and bolts, welds, rivets or otherwise fastens them to foundation or other structures, using handtools and power tools.

May operate engine lathe to grind, file, and turn machine parts to dimensional specifications.

May repair and lubricate machines and equipment.

May install robot and modify its program, using teach pendant.

May perform installation and maintenance work as part of team of skilled trades workers.

The average length of time it takes before finding employment in this field is a few months.

The national salary range is \$21,000 to \$29,999 per year.

Mold Maker, Die-Casting and Plastic Molding

DOT Code: 601.280-030

OES Code: 89102

GOE Code: 05.05.07

Specific vocational preparation averages four to ten years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Lays out, machines, fits, assembles, and finishes metal parts to make and repair dies for diecasting of metal products and metal molds for injection or compression molding of plastic or glass products, analyzing specifications, and applying knowledge of die and mold design and construction.

Studies blueprints of product and die or mold, and computes specifications, applying knowledge of shop mathematics and metal diecasting or plastic or glass molding processes and machinery.

Plans sequence of operations, visualizing shape of die or mold in reverse of product.

Measures, marks, and scribes metal stock to lay out for machining.

Gives machining specifications to Tool-Machine Set-up Operators or sets up and operates machines, such as horizontal boring mill, engine lathe, profile milling machine, and pantograph machine to machine outer dimensions and contoured cavity of die or mold.

Grinds, files, and sands parts, using files, emery cloth, and powered grinders to fit parts for assembly and to smooth and finish cavity.

Assembles die or mold, using handtools. Verifies dimensions, using calipers, planer gauges, and dial indicators.

May repair molds.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national salary range is \$21,000 to \$29,999 per year.

Nurse Assistant

DOT Code: 355.674-014

OES Code: 66008

GOE Code: 10.03.02

Alternate title: Nurse Aide.

Specific vocational preparation averages three to six months.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Performs any combination of the following duties in care of patients in hospital, nursing home, or other medical facility, under the direction of nursing and medical staff.

Answers signal lights, bells or intercom system to determine patients' needs.

Bathes, dresses, and undresses patients.

Serves and collects food trays and feeds patients requiring help.

Transports patients for examinations and treatments and remains with patients, performing such duties as holding instruments and adjusting lights.

Turns and repositions bedfast patients, alone or with assistance, to prevent bedsores.

Changes bed linens, runs errands, directs visitors, and answers telephone.

Takes and records temperature, blood pressure, pulse, and respiration rates, and food and fluid intake and output, as directed.

Cleans, sterilizes, stores, prepares, and issues dressing packs, treatment trays, and other supplies.

Dusts and cleans patients' rooms.

The average length of time it takes before finding employment in this field is a few months to a year.

The national average salary range is \$17,000 to \$20,999 per year.

Offset Press Operator I

DOT Code: 651.382-042

OES Code: 92512

GOE Code: 05.05.13

Alternate titles: First Press Operator; Lithographic-Press Operator.

Specific vocational preparation averages four to ten years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Makes ready and operates web or sheet-fed offset printing press to print single and multicolor copy from lithographic plates.

Examines job order to determine quantity to be printed, stock specifications, colors, and special printing instructions.

Measures plate thickness and inserts packing sheets on plate cylinder to build up plate to printing height and installs and locks plate into position, using handtools, to achieve pressure required for printing.

Washes plate to remove protective gum coating.

Measures paper thickness and adjusts space between blanket and impression cylinders according to thickness of paper stock.

Fills ink and dampening solution fountain and adjusts controls to regulate flow of ink and dampening solution to plate cylinder.

Starts press, examines printed copy for intensity, position on paper, and registration, and makes adjustment to press throughout production run to maintain specific registration and color density.

Removes and cleans plate and cylinders.

May apply packing sheets to blanket cylinder to build up blanket thickness to diameter of plate cylinder.

May load paper into feeder or install rolls of paper, make adjustments to feeder delivery mechanisms, and unload printed material from delivery mechanism.

May lead, give directions to, and monitor work of assistant press operator, feeder, jogger, or roll tender.

The average length of time it takes before finding employment in this field is a few months to a year.

The national average salary range is \$17,000 to \$20,999 per year.

Optician, Dispensing

DOT Code: 299.361-010

OES Code: 32514

GOE Code: 05.10.01

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Fills ophthalmic eyeglass prescriptions and fits and adapts lenses and frames, utilizing written optical prescription.

Evaluates prescription in conjunction with client's vocational and avocational visual requirements.

Determines client's current lens prescription, when necessary, using lensometer or lens analyzer and client's eyeglasses.

Recommends specific lenses, lens coatings, and frames to suit client needs.

Assists client in selecting frames according to style and color, coordinating frames with facial and eye measurements and optical prescription.

Measures client's bridge and eye size, temple length, vertex distance, pupillary distance, and optical centers of eyes, using millimeter rule and light reflex pupillometer.

Prepares work order and instructions for grinding lenses and fabricating eyeglasses.

Verifies finished lenses are ground to specification.

Heats, shapes, or bends plastic or metal frames to adjust eyeglasses to fit client, using pliers and hands.

Instructs clients in adapting to, wearing, and caring for eyeglasses.

Sells optical goods, such as binoculars, plano sunglasses, magnifying glasses, and low vision aids.

Repairs damaged frames.

Is required to hold a license in Virginia.

May fabricate lenses to prescription specification.

May select and order frames for display.

May grind lens edges or apply coating to lenses.

May manage one or more optical shops.

May compute amount of sale and collect payment for services.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$28,000 per year and above.

Painter
(Construction)

DOT Code: 840.381-010

OES Code: 87402

GOE Code: 05.10.07

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Applies coats of paint, varnish, stain, enamel or lacquer to decorate and protect interior or exterior surfaces, trimmings, and fixtures of buildings and other structures.

Reads work order or receives instructions from supervisor or homeowner regarding painting.

Smooths surfaces, using sandpaper, brushes or steel wool, and removes old paint from surfaces, using paint remover, scraper, wire brush or blowtorch to prepare surfaces for painting.

Fills nail holes, cracks, and joints with caulk, putty, plaster or other filler, using caulking gun and putty knife.

Selects premixed paints, or mixes required portions of pigment, oil, and thinning and drying substances to prepare paint that matches specified colors.

Removes fixtures, such as pictures and electric switchcovers from walls prior to painting, using screwdriver.

Spreads dropcloths over floors and room furnishings and covers surfaces, such as baseboards, door frames, and windows with masking tape and paper to protect surfaces during painting.

Paints surfaces, using brushes, spraygun, or paint rollers.

Simulates wood grain, marble, brick or tile effects.

Erects scaffolding or sets up ladders to perform tasks above ground level.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$14,000 to \$16,999 per year.

Pipefitter

DOT Code: 862.281-022

OES Code: 87502

GOE Code: 05.05.03

Alternate titles: Plumber, Pipe Fitting.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Lays out, assembles, installs, and maintains pipe systems, pipe supports, and related hydraulic and pneumatic equipment for steam, hot water, heating, cooling, lubri-cating, sprinkling and industrial production and processing systems, applying knowledge of system operation, and following blue-prints.

Selects type and size of pipe, and related materials and equipment, such as supports, hangers, and hydraulic cylinders, according to specifications.

Inspects work site to determine presence of obstructions and ascertain that holes cut for pipe will not cause structural weakness.

Plans installation or repair to avoid obstructions and to avoid interfering with activities of other workers.

Cuts pipe, using saws, pipe cutter, hammer and chisel, cutting torch, and pipe cutting machine.

Threads pipe, using pipe threading machine.

Bends pipe, using pipe bending tools and pipe bending machine.

Assembles and installs variety of metal and nonmetal pipes, tubes, and fittings, including iron, steel, copper, and plastic.

Connects pipes, using threaded, caulked, soldered, brazed, fused, or cemented joints, and handtools.

Secures pipes to structure with brackets, clamps, and hangers, using handtools and power tools.

Installs and maintains hydraulic and pneumatic components of machines and equipment, such as pumps and cylinders, using handtools.

Installs and maintains refrigeration and air-conditioning systems, including compressors, pumps, meters, pneumatic and hydraulic controls, and piping, using handtools and power tools, and following specifications and blue prints.

Increases pressure in pipe system and observes connected pressure gauge to test system for leaks.

May weld pipe supports to structural steel members; observe productions machines, in assigned area of manufacturing facility to detect machinery malfunctions; or operate machinery to verify repair; modify programs of automated machinery.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$21,000 to \$27,999 per year.

Plumber

DOT Code: 862.381-030

OES Code: 87502

GOE Code: 05.05.03

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Assembles, installs, and repairs pipes, fittings, and fixtures of heating, water, and drainage systems, according to specifications and plumbing codes.

Studies building plans and working drawings to determine work aids required and sequence of installations.

Inspects structure to ascertain obstructions to be avoided to prevent weakening of structure resulting from installation of pipe.

Locates and marks position of pipe and pipe connections and passage holes for pipes in walls and floors, using ruler, spirit level, and plumb bob.

Cuts openings in walls and floors to accommodate pipe and pipe fittings, using handtools and power tools.

Cuts and threads pipe, using pipe cutters, cutting torch, and pipe threading machine.

Bends pipe to required angle by use of pipebending machine or by placing pipe over block and bending it by hand.

Assembles and installs valves, pipe fittings, and pipes composed of metals, such as iron, steel, brass, and non-metals, such as glass, vitrified clay, and plastic, using handtools and power tools.

Joins pipes by use of screws, bolts, fittings, solder, plastic solvent, and caulks joints.

Fills pipe system with water or air and reads pressure gages to determine whether system is leaking.

Installs and repairs plumbing fixtures, such as sinks, commodes, bathtubs, water heaters, hot water tanks, garbage disposal units, dishwashers, and water softeners.

Repairs and maintains plumbing by replacing washers in leaky faucets, mending burst pipes, and opening clogged drains.

May weld holding fixtures to steel structural members.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$21,000 to \$27,999 per year.

Power Plant Operator

DOT Code: 952.382-018

OES Code: 95200

GOE Code: 05.06.01

Alternate titles: Power Engineer; Powerhouse Engineer; Power-Plant Engineer.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Operates boilers, turbines, generators, and auxiliary equipment at generating plant to produce electricity.

Monitors control board and regulates equipment, according to procedures and information obtained from recording and indicating instruments.

Adjusts controls of water and cold feed systems, blowers, and igniters to start up or shut down boilers.

Controls operation of boiler auxiliary equipment, such as water and vacuum pumps, coal driers and pulverizers, steam condensers, and soot blowers, to ensure efficient operation of boilers.

Adjusts boiler controls to provide steam at specified temperature and pressure for turbine loads according to power demands.

Adjusts controls to regulate speed, voltage, and phase of incoming turbines to coincide with voltage and phase of power being generated.

Synchronizes incoming generating units with units in operation and closes circuit breaker at exact instant of coincidence.

Monitors gauges to determine effect of generator load on related equipment, such as bus bars and voltage regulators.

Adjusts transformer controls to regulate flow of power between generating stations and substations.

Operates switchgears to regulate and transfer power loads to protect maintenance workers engaged in repairing or cleaning equipment.

Records malfunctions of equipment, instruments or controls on logsheet.

The average length of time it takes before finding employment in this field is a few months to a year.

The national average salary range is \$28,999 per year and above.

Refrigeration Mechanic

DOT Code: 637.261-026

OES Code: 85902

GOE Code: 05.05.09

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Installs and repairs industrial and commercial refrigerating systems according to blueprints and engineering specifications, using knowledge of refrigeration, structural layout, and function and design of components.

Lays out reference points for installation of structural and functional components, using measuring instruments, such as tape, transit, plumb bob, levels, and square.

Drills holes and installs mounting brackets and hangers into floor and walls of building.

Lifts and aligns components into position, using hoist or block and tackle.

Screws, bolts, rivets, welds, and brazes parts to assemble structural and functional components, such as motors, controls, switches, gauges, wiring harnesses, valves, pumps, compressors, condensers, cores, and pipes.

Cuts, threads, and connects pipe to functional components and water or power system of premises.

Pumps specified gas or fluid into system.

Starts system, observes operation, reads gauges and instruments, and adjusts mechanisms, such as valves, controls, and pumps to control level of fluid, pressure, and temperature in system.

Dismantles malfunctioning systems and tests components, using electrical, mechanical, and pneumatic testing equipment.

Replaces or adjusts defective or worn parts to repair systems.

May install wiring to connect components to electric power source.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$17,000 to \$20,999 per year.

Sheet-Metal Worker

DOT Code: 804.281-010

OES Code: 87823

GOE Code: 05.05.06

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Plans, lays out, fabricates, assembles, installs, and repairs sheet metal parts, equipment, and products, utilizing knowledge of working characteristics of metallic and nonmetallic materials, machining, and layout techniques, using handtools, power tools, machines, and equipment.

Reads and interprets blueprints, sketches, or product specifications to determine sequence and methods of fabricating, assembling, and installing sheet metal products.

Selects gauge and type of sheet metal, such as galvanized iron, copper, steel or aluminum, or nonmetallic material, such as plastics or fiberglass, according to product specifications.

Lays out and marks dimensions and reference lines on material, using scribes, dividers, squares, and rulers, applying knowledge of shop mathematics and layout techniques to develop and trace patterns of product or parts, or using templates.

Sets up and operates fabricating machines, such as shears, brakes, presses, forming rolls, and routers, to cut, bend, block, and form or straighten materials.

Shapes metal material over anvil, block, or other form, using handtools.

Trims, files, grinds, deburrs, buffs, and smooths surfaces, using handtools and portable power tools.

Welds, solders, bolts, rivets, screws, clips, caulks or bonds components parts to assemble products, using handtools, power tools, and equipment.

Installs assemblies in supportive framework according to blueprints, using handtools, power tools, and lifting and handling devices.

Inspects assemblies and installation for conformance to specifications, using measuring instruments, such as calipers, scales, dial indicators, gauges, and micrometers.

Repairs and maintains sheet metal products.

May operate computer-aided-drafting (CAD) equipment to develop scale drawings of product or system.

May operate laser-beam cutter or plasma arc cutter to cut patterns from sheet-metal.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$14,000 to \$16,999 per year.

Structural Steel Worker

DOT Code: 801.361-014

OES Code: 87320

GOE Code: 05.05.06

Alternate titles: Bridge Worker; Housesmith; Iron Erector; Ironworker; Steel Erector; Structural-Iron Erector; Structural-Iron Worker; Structural-Steel Erector.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Performs any combination of the following duties to raise, place, and unite girders, columns, and other structural-steel members to form completed structures or structure frameworks, working as member of crew.

Sets up hoisting equipment for raising and placing structural-steel members.

Fastens steel members to cable of hoist, using chain, cable, or rope.

Signals worker operating hoisting equipment to lift and place steel member.

Guides member, using tag line (rope) or rides on member in order to guide it into position.

Pulls, pushes, or pries steel members into approximate position while member is supported by hoisting device.

Forces members into final position, using turnbuckles, crowbars, jacks, and handtools.

Aligns rivet holes in member with corresponding holes in previously placed member by driving drift pins or handle of wrench through holes.

Verifies vertical and horizontal alignment of members, using plumb bob and level.

Bolts aligned members to keep them in position until they can be permanently riveted, bolted, or welded in place.

Catches hot rivets tossed by rivet heater (heat treating) in bucket in inserts rivets in holes, using tongs.

Bucks (holds) rivets while pneumatic riveter uses air hammer to form heads on rivets.

Cuts and welds steel members to make alterations, using oxyacetylene welding equipment.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$17,000 to \$20,999 per year.

Television and Radio Repairer

DOT Code: 720.281-018

OES Code: 85708

GOE Code: 05.10.03

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Repairs and adjusts radios and television receivers, using handtools and electronic testing instruments.

Tunes receiver on all channels and observes audio and video characteristics to locate source of trouble.

Adjusts controls to obtain desired density, linearity, focus, and size of picture.

Examines chassis for defects.

Tests voltages and resistances of circuits to isolate defect, following schematic diagram using voltmeter, oscilloscope, signal generator, and other electronic testing instruments.

Tests and changes tubes.

Solders loose connections and repairs or replaces defective parts, using handtools and soldering iron.

Repairs radios and other audio equipment. May install televisions.

The average length of time it takes before finding employment in this field is a few months.

The national average salary range is \$17,000 to \$20,999 per year.

Tool-and-Die Maker

DOT Code: 601.260-010

OES Code: 89102

GOE Code: 05.05.07

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Analyzes specifications, lays out metal stock, sets up and operates machine tools, and fits and assembles parts to fabricate and repair metalworking dies, cutting tools, jugs, and fixtures, gauges, and machinists handtools, applying knowledge of tool-and-die design and construction, shop mathematics, metal properties, and layout, machining and assembly procedures.

Studies specifications, such as blueprints, sketches, models or descriptions, and visualizes product to determine materials required and machines to be used to fabricate parts.

Computes dimensions, plans layout, and determines assembly method and sequence of operations.

Measures, marks, and scribes metal stock for machining.

Sets up and operates machine tools, such as lathes, milling machine, shaper, and grinder, to machine parts and verifies conformance of machined parts to specifications.

Lifts machined parts manually or using hoist, and positions and secures parts on surface plate or worktable, using devices, such as vises, V-blocks, and angle plates.

Smooths flat and contoured surfaces, using scrapers, abrasive stones, and power grinders, and fits and assembles parts together and into assemblies and mechanisms, using handtools.

Verifies dimensions, alignments, and clearances, using measuring instruments, such as dial indicators, gauge blocks, thickness gauges, and micrometers.

Heat-treats tools or parts.

May connect wiring and hydraulic lines to install electrical and hydraulic components.

May examine standard or previously-used dies, tools, and jigs and fixtures, and recommend design modifications regarding construction and function of part.

May develop specifications from general descriptions for specialty tools and draw or sketch design of product.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$21,000 to \$27,999 per year.

Wastewater Treatment Plant Operator

DOT Code: 955.362-010

OES Code: 95002

GOE Code: 05.06.04

Alternate titles: Disposal-Plant Operator; Sewage-Plant Operator; Utilities Operator.

Specific vocational preparation averages two to four years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Operates sewage treatment, sludge processing, and disposal equipment in wastewater (sewage) treatment plant to control flow and processing of sewage.

Monitors control panels and adjusts valves and gates manually or by remote control to regulate flow of sewage.

Observes variations in operating conditions and interprets meter and gauge readings and tests results to determine load requirements.

Starts and stops pumps, engines, and generators to control flow of raw sewage through filtering, settling, aeration, and sludge digestion processes.

Maintains log of operations and records meter and gauge readings.

Gives directions to wastewater-treatment-plant attendants and sewage-disposal workers in performing routine operations and maintenance.

May collect sewage sample, using dipper or bottle and conduct laboratory tests, using testing equipment, such as colorimeter.

May operate and maintain power generating equipment to provide steam and electricity for plant.

The average length of time it takes before finding employment in this field is a few months to a year.

The national average salary range is \$21,000 to \$27,999 per year.

Welder, Combination

DOT Code: 819.384-010

OES Code: 93914

GOE Code: 05.05.06

Specific vocational preparation averages one to three years.

In the classroom:

Completion of the 144 hours of related classes at an approved institution.

On the job:

Welds metal components together to fabricate or repair products, such as machine parts, plant equipment, mobile homes, motors, and generators, according to layouts, blueprints, or work orders, using brazing and variety of arc and gas-welding equipment.

Welds metal parts together, using both gas welding or brazing and any combination of arc welding processes. Performs related tasks, such as thermal cutting and grinding.

Repairs broken or cracked parts, fills holes and increases sized of metal parts.

Positions and clamps together components of fabricated metal products preparatory to welding.

May locate and repair cracks on industrial engine cylinder heads, using inspections equipment and gas torch.

May be required to pass employer performance tests for standard tests.

The average length of time it takes before finding employment in this field is a couple of weeks.

The national average salary range is \$17,000 to \$20,999 per year.